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Market Timing for the Individual Investor: Using the Predictability of Long-Horizon Stock Returns to Enhance Portfolio Performance

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Recent research indicates that dividend yield and earnings-price ratio can partially predict long-horizon stock returns. We examine whether individual investors can successfully construct timing portfolios based on either of these variables or a measure of the expected market risk premium. The out-of-sample tests in this study require that investors rely only on information that was available at the time of the market-timing decision. Timing portfolios based on the market risk premium show the strongest ability to time the market. We present an economic rationale for the results that is consistent with efficient markets.

I. INTRODUCTION

Several studies by leading financial economists conclude that long-horizon stock returns are partially predictable (e.g., Campbell & Shiller, 1988; Fama & French, 1988a,b, 1989; and Fama, 1991). These studies suggest that up to 25% of the variation in long-horizon returns on large (e.g., *S&P*) stocks is predictable. A larger portion of long-horizon small stock returns appears predictable.

This study investigates the implications of the market predictability literature for market timing by individual investors. Can the individual investor construct timing portfolios that outperform nontiming benchmark portfolios where the timing portfolios are based on variables that show a consistent relation with long-horizon stock returns? We address this question by constructing timing portfolios that combine the *S&P Index* and Treasury bills and, separately, portfolios that combine

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small stocks and Treasury bills. We then calculate several measures of portfolio performance, including raw return and risk-adjusted return.

By every criterion, timing portfolios based on a measure of the expected market risk premium outperform *S&P* benchmark portfolios. Of the small-stock timing portfolios, those based on the expected market risk premium perform best, but portfolios based on dividend yield and earning-price ratios also show some ability to time small stock returns. Finally, we discuss the limitations of this study and their implications for individual investors that plan to follow a market timing strategy.

II. Review of Literature

Several financial studies indicate that long-horizon stock returns are partially predictable. Many economists argue that this predictability reflects the action of a rationally priced stock market with a time-varying market risk premium. Simply put, average stock returns tend to be generous when the market is priced to offer a generous risk premium.

Nobel-laureate William Sharpe, who sells market timing advice based on a relative market risk premium, expresses this view, "This is not a story that the market is screwed up. This is a story of how investors behave when their wealth changes. Say I tell you the relative risk premium is 120—you'll get 120% of the normal expected return for bearing risk. If that was the only thing I told you, you'd say, 'Let's buy stocks.' But what if I also told you the reason for that is we're in a recession and someone in your family is out of work. If you're average, you'll say, 'I guess these are offsetting. I'll stay with what I've got.' In fact, that's what has to happen in an efficient market. The risk premium has to adjust to where the average investor doesn't want to do anything" (Berss, 1990, p. 78).

Fama and French also support this view. They conclude that the market risk premium is highly autocorrelated, but slowly mean reverting[1]; that is, when the risk premium is large it tends to remain large for several quarters while slowly reverting to its historic mean, and vice-versa. This produces a predictable component of stock returns that increases roughly proportionately with the return horizon out to one or two years.

We offer the following illustration of their story. Let P represent the price of an index of stocks. For simplicity, we assume the zero growth model with projected year-ahead dividends D_1 equal to projected earnings E_1. That is, $D_1 = E_1$. In this model,

$$P = D_1/K, \tag{1A}$$

where the required rate of return $K = r + MRP$, r denotes the risk-free interest rate, and MRP denotes the unobservable market risk premium. It follows that

$$D_1/P = E_1/P = r + MRP. \tag{1B}$$

As equation 1B shows, both dividend-price and earnings-price ratios perfectly reflect shocks to the market risk premium *that are independent of dividend and earnings forecasts*. These ratios are not important per se, but only to the degree that they reflect movement in the unobservable market risk premium. Thus theory suggests that the predictive content of historic dividend-price and earnings-price ratios reflects their tendency to proxy for the unobservable market risk premium.

Suppose the risk-free interest rate is 5% and the market risk premium is 8%, its historic average. A shock raises the premium to 9.3%. The rise in the market premium drives the current stock price from \$7.7D to \$7D. If the premium followed a random walk then stocks would now offer a permanently higher expected return. However, the market premium slowly reverts to its mean. During the reversion, the expected risk premium exceeds its historic mean. After the reversion, the market risk premium is again 8% and the stock price \$7.7D.

This economic story can explain the evidence supporting the predictability of long-horizon stock returns.

1. Model 1B explains why dividend yield and earnings-price ratio can predict stock returns. More generally, any variables that move with the time-varying market risk premium should be able to predict long-horizon stock returns.
2. McQueen and Thorley (1991) found that a bad year in the stock market tends to follow two good calendar years and a good year tends to follow two bad years. This pattern is expected if movements in the market risk premium strongly influence individual year stock returns.
3. There appears to be a transitory, and thus predictable, component of stock price. In the example above, the shock to the market risk premium produced a transitory drop in stock price that is eventually offset by subsequent gains. Equivalently, the mean-reverting market risk premium gives rise to negative autocorrelations in distant stock returns; the rise in the market risk premium produces a current period loss that is offset by higher subsequent returns.

III. CONSTRUCTION OF TIMING PORTFOLIOS

Prediction Variables

In this study, we examine whether individual investors can successfully construct timing portfolios using three variables shown to predict stock returns. The first of the variables is the end-of-quarter earnings-price ratio on the *Standard and Poor's Composite Index, EP*. The second is the median year-ahead dividend yield as published by *Value Line, YIELD*.

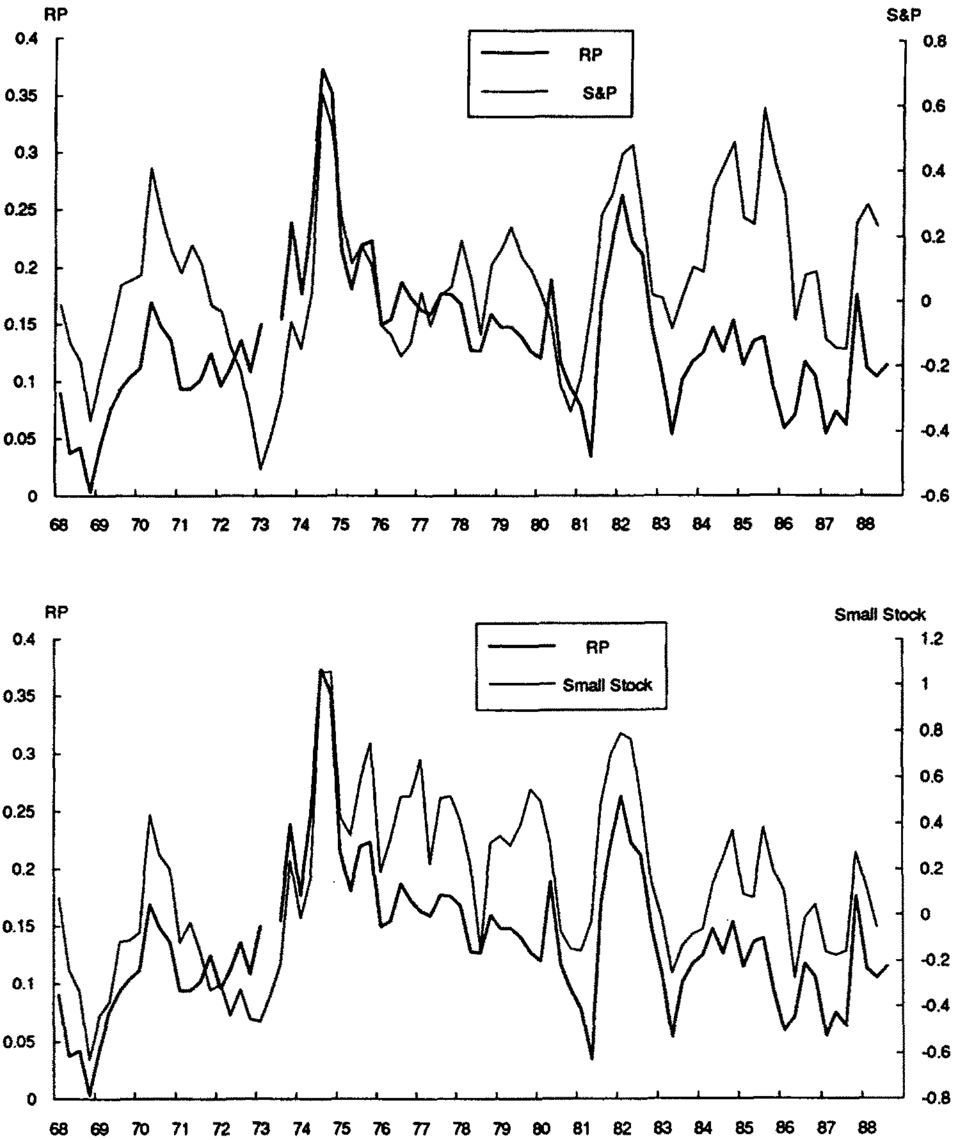


Figure 1. Relationship Between RP and Cumulative Six-Quarters-Ahead Excess Returns on S&P and Small Stock Indexes

The third predictor is a direct measure of the expected market risk premium: $RP = (YIELD + CapGains) - R$. *CapGains* denotes the median annual capital gain return and is calculated $(1 + APPREC)^{0.25} - 1$ where *APPREC* is the median three-to-five year price appreciation potential as forecast by *Value Line*. The variable *R* denotes the bond-equivalent yield on three-month Treasury bills. *Value*

Line's "Summary and Index" highlights *YIELD* and *APPREC* weekly on the cover page.

Figure 1 shows the close relationships between *RP* and cumulative six-quarters-ahead excess returns on both the *S&P* and small stock indexes. The *RP* frequently hit a peak immediately prior to a strong six-quarter return. For example, *RP* reached a peak at the end-of-September 1974. This correctly predicted the peak excess *S&P* return from October 1, 1974, through March 31, 1976.

The *RP* offers a number of important advantages compared to the ratio of past-four-quarters dividends to current stock price, the ratio most prevalent in prior studies of stock predictability.

1. It is a direct measure of the unobservable market risk premium, the alleged source of predictive content.
2. It uses forecasts of dividends and returns instead of historic information, and, not surprisingly, forecasts provide a better measure of expectations.
3. Value Line forecasts are generally accessible to the individual investor.

In a recent study, Reichenstein and Rich (1992) examined the ability of *EP*, *YIELD*, and *RP* to explain *S&P* and small stock returns for 1968–1988 and for two equal subperiods. The market risk premium *RP* is the only candidate to show a consistent in-sample relation with *S&P* returns. The risk premium *RP*, earnings-price ratio *EP*, and dividend-price ratio *YIELD* all show consistent in-sample relations with long-horizon small stock returns. The next section describes the timing strategies considered in this study.

Market Timing Strategies

Each quarter from the third quarter of 1978 (1978.3) through the fourth quarter of 1988 (1988.4) we form out-of-sample timing portfolios based on the three prediction variables. Since *RP* is the only candidate to show a consistent in-sample relation to *S&P* stock returns, we determine whether it can enhance large (i.e., *S&P*) stock returns in out-of-sample tests. Since all three show a consistent relation to in-sample small stock returns, we determine whether any of them can enhance small stock returns in out-of-sample tests.

We examine two basic timing strategies, the first, the all-or-nothing strategy, calls for a portfolio that each quarter is either 100% in stocks or 100% in Treasury bills. Each quarter a regression of 1968.2-to-date stock returns on the prediction variable determines whether the timing portfolio invests in stocks or bills.[2]

Consider the general regression:

$$r(t, t+n-1) = a + b^{*}X(t-1) + e(t), \qquad (2)$$

where $r(t, t+n-1)$ is the n-quarters-ahead market risk premium (market return less Treasury bill return), $X(t-1)$ is the time $t-1$ value of the prediction variable, and

$e(t)$ is the regression residual. If the fitted value $\hat{a} + \hat{b}^*X(t-1)$ is positive, the all-or-nothing portfolio consists of stocks; if negative, it consists of Treasury bills.

For example, the 1968.2–1977.1 regression of six-quarter small stock excess returns on the Value Line market risk premium is:[3]

$$r(t, t+5) = -0.2717 + 1.83RP(t-1).$$

If the end-of-June 1978 value of RP exceeds 0.148 (0.2717/1.83), then the fitted value is positive and the timing portfolio invests in small stocks for the 1978.3 quarter. If less than 0.134, then it invests in bills. We update the regressions every four quarters.[4] The forecast horizon in (2) is set at six quarters for RP and eight quarters for the other candidates.[5] We compare all-or-nothing portfolio returns to that on a buy-and-hold benchmark portfolio that always allocates 100% to stocks.

The second timing strategy, the variable-weights strategy, better reflects timing strategies in practice in that it allows portfolio weights of stocks and bills to vary according to market prospects, but it does not require either the 100% stocks or 100% bills extremes. This strategy calls for the timing portfolio to contain 25% stock when the market predictor signals "poor" stock prospects, 50% stock when it signals "average" prospects, and 75% when it signals "good" prospects. The balance of the portfolio is invested in T-bills. The benchmark portfolio begins each quarter with bill-stock weights of 50% each.

Stock prospects depend upon whether the prediction variable is high, average, or low by historic standards. Poor and good stock prospects occur when the variable falls in, respectively, the bottom and top fourth of its 1968.1-to-date distribution. Average stock prospects occur when the variable falls in the middle 50% of its distribution. Distributions are updated every four quarters.

Table 1 summarizes the 1968.1–1988.3 distributions of the predictive variables and the 1968.2–1988.4 (continuously compounded) quarterly risk premiums on the *S&P* and small stocks. It provides historic perspective for individual investors who wish to use the variables.

TABLE 1.
Summary Statistics: 1968–1988

Variable	*Mean*	*St. Dev*	*1st Q*	*Median*	*3rd Q*
RP	13.74%	6.34%	10.10%	12.72%	16.91%
EP	8.77%	2.80%	6.08%	8.37%	11.09%
YIELD	4.07%	1.04%	3.2%	4.1%	4.9%
S&P	2.40%	8.82%	–2.61%	3.05%	8.31%
Small Stock	3.07%	13.62%	–5.02%	1.82%	12.19%

Note: *RP*, *EP*, and *YIELD* refer to the *Value Line* estimates of the market risk premium, earnings-price ratio on *S&P 500*, and *Value Line* estimate of median year-ahead dividend yield. *S&P* and Small Stock show the distribution of quarterly risk premiums—total returns less Treasury bill returns.

	Equity Weights of Timing Portfolios	
S&P Index	*All-or-Nothing*	*Variable Weights*
RP	0 or 100% stock	25, 50 or 75% stock
Benchmark	100% stock	50% stock
Small Stocks	*All-or-Nothing*	*Variable Weights*
RP	0 or 100% stock	25, 50, or 75% stock
EP	0 or 100% stock	25, 50, or 75% stock
YIELD	0 or 100% stock	25, 50, or 75% stock
Benchmark	100% stock	50% stock

Each portfolio contains stocks and/or Treasury bills. The figure shows the equity weights.

Figure 2. Outline of Timing Strategies

The average *annual* risk premium (*RP*) of 13.74% equals a continuously compounded quarterly return of 3.22%. This exceeds both the average small stock premium 3.07% and average large stock premium 2.40%. We attribute this upward bias to the optimistic nature of investment advisory services. Nevertheless, the results of this study suggest that movements in *RP* mirror movements in the unobservable expected market risk premium.

Figure 2 summarizes the market timing and benchmark portfolios. For the *S&P* Index, we compare returns on two *RP*-based portfolios with returns on their benchmark portfolios. The all-or-nothing portfolio contains either 0% or 100% stock. Its returns are compared to the returns on a buy-and-hold 100% stock portfolio. The variable-weights timing portfolio contains 25%, 50%, or 75% stock. Its returns are compared to the returns on a constant-weights 50% debt-50% stock portfolio. For small stocks, we examine separately the market timing ability of *RP*, *EP*, and *YIELD*.

IV. Overview of Tests

In this section we examine whether *RP* can be used to enhance portfolio returns using large (i.e., *S&P*) stocks and whether *RP*, *EP*, or *YIELD* can be used to enhance portfolio returns using small stocks.[6] The 1978.3–1988.4 out-of-sample performance of each timing portfolio is compared to the performance of a benchmark portfolio. We use five performance criteria to determine whether *RP*, *EP*, or *YIELD* can be used to time the market. The criteria include raw return, risk-adjusted return, and three *CAPM*-based regressions of timing ability.

TABLE 2.
Raw Returns

Portfolio	*Mean Quarterly Risk Premium*	*Mean Weight of Stock*	*Mean Quarterly Risk Premium*	*Mean Weight of Stock*
S&P Index	*All or Nothing*		*Variable Weights*	
RP	1.49%	38.1%	1.04%	47.0%
Benchmark	1.38%	100.0%	0.69%	50.0%
Small Stock Index	*All or Nothing*		*Variable Weights*	
RP	2.22%	54.8%	1.43%	47.0%
EP	1.63%	76.2%	1.12%	55.4%
Yield	1.62%	45.2%	1.35%	42.3%
Benchmark	1.74%	100.0%	0.87%	50.0%

Note: All returns are continuously compounded. Thus mean returns are geometric means. Mean quarterly risk premium equals the average of portfolio returns minus the return on T-Bills. All-or-nothing timing portfolio has either 100% stock or 100% Treasury bills. Its benchmark is a buy-and-hold stock portfolio. Variable-weights timing portfolio has weights of 75%, 50%, or 25% on stocks and the rest in Treasury bills. Its benchmark portfolio always maintains a 50–50 stock-bills mix.

Raw Return

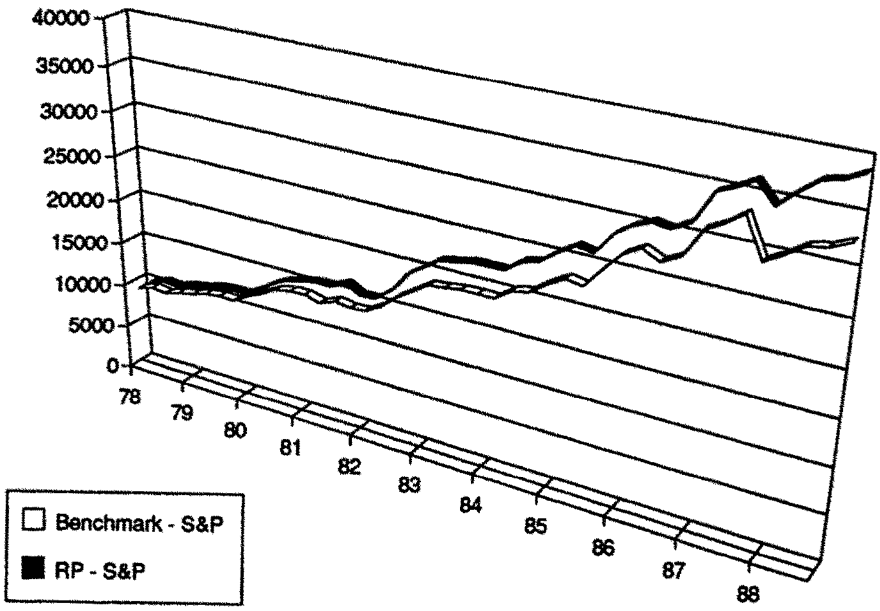
Table 2 presents the raw (unadjusted for risk) returns on timing and benchmark portfolios. The mean quarterly risk premium denotes the average of the portfolio return less the return on Treasury bills.

S&P Index. Both the *RP*-based all-or-nothing and variable-weights timing portfolios earned higher raw returns than their benchmark portfolios. The mean risk premium for the all-or-nothing timing portfolio was 1.49%. Its benchmark portfolio earned 1.38%. The mean risk premium on the variable-weights timing portfolio (1.04%) also exceeds its benchmark portfolio (0.69%). The all-or-nothing portfolio managed to earn a higher raw return than the buy-and-hold benchmark, despite being out of the market 62% of the time.

Small Stocks. Among the all-or-nothing timing portfolios, only the *RP*-based portfolio earned more (2.22%) than the benchmark (1.74%). It earned higher returns despite being out of the market about half of the time. The *EP*-based (1.63%) and *YIELD*-based (1.62%) all-or-nothing portfolios failed to match the benchmark.

All of the variable-weights timing portfolios earned more than the benchmark. With the exception of the *EP*-based portfolio, the timing portfolios earned higher return despite a lower average exposure to stocks. The *RP*-based portfolio earned the highest return (1.43%).

Figure 3 shows that the higher raw returns on the timing portfolios produce substantial long-run wealth implications. For example, $10,000 invested in the variable-weights *S&P* benchmark portfolio (i.e., 50% *S&P* and 50% T-bills) at the beginning of the third quarter of 1978 would have grown to $33,303 by the end of



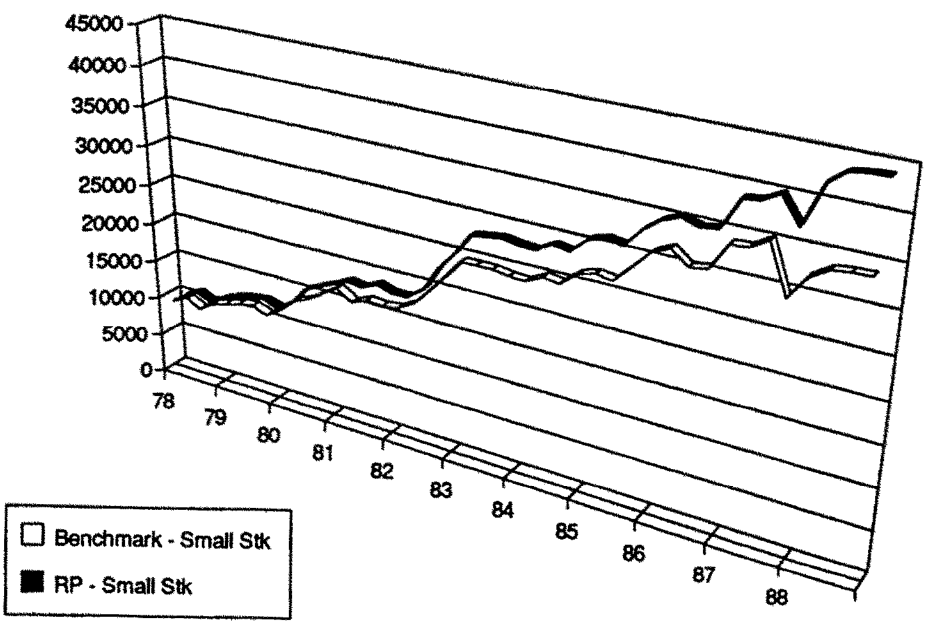


Figure 3. Growth of $10,000 Investment in Benchmark and Variable-Weight Timing Portfolios

1988. However, had the $10,000 been invested in the *RP*-based variable-weights timing portfolio instead, it would have grown to $38,711. The results from timing with small stocks are even more impressive. The benchmark portfolio would have grown to $34,454 while the *RP*-based variable-weights portfolio would have grown to $43,722. As Figure 3 shows, the gains from timing accrued slowly but steadily over the entire period.

Risk-Adjusted Return

Valid performance comparisons across portfolios should consider differences in portfolio risk. The Sharpe (1966) ratio incorporates these differences by dividing the mean quarterly risk premium by its standard deviation, thus providing a measure of return per unit of risk. Table 3 presents the Sharpe ratios for the timing and benchmark portfolios.

S&P Index. Both *RP*-based timing portfolios outperform their benchmark. The all-or-nothing portfolio earned twice as much return per unit of risk as the benchmark, 0.328 versus 0.163. The variable-weights portfolio earned 60% more return per unit of risk, 0.266 versus 0.163.

Small stock. All of the timing portfolios earned higher risk-adjusted returns than their benchmark portfolios. However, the *RP* portfolio (0.319) earned much larger risk-adjusted returns than the *YIELD* portfolio (0.180), its nearest competitor. Among the variable-weights portfolios, *RP* again performed best (0.244) followed

TABLE 3.
Risk-Adjusted Returns: Sharpe Ratios

Portfolio	*All or Nothing*	*Variable Weights*
S&P Index		
RP	0.328	0.266
Benchmark	0.163	0.163
Small Stock Index		
RP	0.319	0.244
EP	0.165	0.160
YIELD	0.180	0.234
Benchmark	0.143	0.143

Note: All returns are continuously compounded. Thus mean returns are geometric means. The Sharpe ratio reflects return per unit of risk and is defined as the ratio of mean-to-standard deviation of quarterly excess return. All-or-nothing timing portfolio has either 100% stock or 100% Treasury bills. Its benchmark is a buy-and-hold stock portfolio. Variable-weights timing portfolio has weights of 75%, 50%, or 25% on stocks and the rest in Treasury bills. Its benchmark portfolio always maintains a 50–50 stock-bills mix.

closely by *YIELD* (0.234). Both *RP* portfolios earned at least 70% more return per unit of risk than the benchmark portfolios.

Regression Tests of Timing Ability

One weakness of the Sharpe ratio is that it cannot test the statistical significance of the performance differences between timing and benchmark portfolios. The three regressions presented here provide such tests.

Estimates of Jensen (1968) regressions take the following form:

$$r_{pt} - r_{ft} = a + b(r_{mt} - r_{ft}) + e_t$$

where r_{pt} denotes the portfolio return, and $r_{pt} - r_{ft}$ is the quarterly risk premium earned by the timing portfolio, $r_{mt} - r_{ft}$ is the market risk premium, e_t is the error term, and a and b are regression coefficients. A positive intercept, a, indicates that the timing portfolio beats the benchmark portfolio on a risk-adjusted basis. A negative intercept indicates inferior performance. In general, a positive intercept can result from consistent selection of undervalued stocks, successful market timing, or both. For the portfolios considered here, a positive intercept indicates successful market timing since no individual stocks are selected.

Estimation of Quadratic and Dummy regressions provide direct tests of timing ability. They take the forms:

$$r_{pt} - r_{ft} = a + b(r_{mt} - r_{ft}) + c(r_{mt} - r_{ft})^2 + e_t \text{ (Quadratic) and}$$

$$r_{pt} - r_{ft} = a + b(r_{mt} - r_{ft}) + c[D_t(r_{mt} - r_{ft})] + e_t \text{ (Dummy)}$$

where $D_t = 0$ if $r_{mt} > r_{ft}$ and -1 if $r_{mt} < r_{ft}$.

In both regressions a positive "*c*" coefficient indicates successful timing ability.[7] Table 4 presents the results.

S&P Index. The regressions indicate superior timing for the RP-based all-or-nothing portfolio. The Jensen intercept of 1.09% (based on a quarterly-returns regression) indicates a compound annual return advantage of 4.43%. The positive "*c*" in the Quadratic regression indicates a tendency for the timing portfolio's beta to rise with the market return. The positive "*c*" in the Dummy regression indicates that the average beta in an up market (i.e., $r_{mt} > r_{ft}$) was 0.46 more than the average beta in a down market. This indicates that the timing portfolio tended to invest in stocks during an up market and in bills during a down market. Both "*c*" coefficients imply timing ability at significance levels better than 10%.

The regressions lend even stronger support to the claim of timing ability in the variable-weights portfolio. The "*c*" coefficients in the Quadratic and Dummy regressions show significance beyond the 1% level. The Jensen intercept of 0.45% indicates an annual premium of 1.8%.

TABLE 4.
Regression Tests of Timing Strategies

Portfolio		*All or Nothing*		*Variable Weights*	
		a or c	*t-statistic*	*a or c*	*t-statistic*
S&P Index					
RP	Jensen	1.09%	1.80*	0.45%	1.93*
	Quad.	1.01	2.11*	2.93	4.65***
	Dummy	0.46	2.01*	0.62	3.94***
Small Stock Index					
RP	Jensen	1.65%	1.85*	0.65%	1.97*
	Quad.	1.44	3.99***	2.73	5.93***
	Dummy	0.77	3.72***	0.68	4.80***
EP	Jensen	0.48%	0.53	0.19%	0.47
	Quad.	0.36	3.29***	1.73	2.41**
	Dummy	0.50	2.12**	0.27	1.29
YIELD	Jensen	0.68%	0.71	0.59%	1.73*
	Quad.	0.50	1.71*	1.69	2.85***
	Dummy	0.22	0.83	0.37	2.15**

Notes: * Significant at 10% level. ** Significant at 5% level. *** Significant at 1% level

Jensen's Regression: $r_{pt} - r_{ft} = a + b(r_{mt} - r_{ft}) + e_t$

Quadratic Regression: $r_{pt} - r_{ft} = a + b(r_{mt} - r_{ft}) + c(r_{mt} - r_{ft})^2 + e_t$

Dummy Variable Regression: $r_{pt} - r_{ft} = a + b(r_{mt} - r_{ft}) + c[D_t(r_{mt} - r_{ft})] + e_t$

All returns are continuously compounded. Thus mean returns are geometric means.

All-or-nothing timing portfolio has either 100% stock or 100% Treasury bills. Its benchmark is a buy-and-hold stock portfolio. Variable-weights timing portfolio has weights of 75%, 50%, or 25% on stocks and the rest in Treasury bills. Its benchmark portfolio always maintains a 50–50 stock-bills mix.

Small stock. Each of the all-or-nothing timing portfolios demonstrates statistically significant timing ability at the 10% level or better at least once. However, the *RP*-based portfolio produced the strongest evidence of timing ability for each regression type. It produced a Jensen intercept of 1.65% (6.76% annually) and "*c*" coefficients of 1.44 and 0.77 in the Quadratic and Dummy regressions. These are at least 42% larger than the nearest competitor. Only the *RP* portfolio shows significant timing ability at the 10% level or better across all regressions.

A similar story prevails for the variable-weights portfolios. All of these portfolios show significant timing ability at the 10% level at least once. Both *RP* and *YIELD* show significant timing ability across all regression types. However, the *RP* portfolio consistently produces the strongest results.

V. SUMMARY AND IMPLICATIONS

Long-horizon stock returns are partially predictable. The $100,000 per year charged by William Sharpe for his asset allocation advice suggests that pension funds can exploit this predictability (Berss, 1990). But can the individual investor use market predictability to effectively time the market? The evidence presented here suggests that they can.

The results imply that individual investors who specialize in large (i.e., *S&P*) stocks can successfully time the market with *RP*—an estimate of the expected market risk premium based on *Value Line* forecasts. The all-or-nothing timing portfolio beat the buy-and-hold *S&P* benchmark by every criterion. It earned higher raw returns, twice the risk-adjusted return, and it generated evidence of significant timing ability at the 10% level in all three regression tests. Similarly, the *RP*-based variables-weights portfolio beats its *S&P* benchmark by every criterion. All of the regression tests support the claim of timing ability at the 10% level and two of the three tests were significant at the 1% level.

The results also imply that investors can use *RP* to successfully time small stock returns. Among the all-or-nothing strategies, the *RP* portfolio outperformed by every criterion the small stock benchmark portfolio. It also outperformed timing portfolios based on dividend yield (*YIELD*) and earnings-price ratio (*EP*). Among variable-weights strategies, the *RP* portfolio performed best by every criterion. Compared to the nontiming benchmark portfolio, it earned a 2.3% larger annual raw return and 70% larger risk-adjusted return. The *RP* portfolio also showed significant timing ability at the 1% level in two of the three tests and at the 10% level on the remaining test. *YIELD* beats the benchmark by every criterion, and *EP* beats it by most criteria. They all demonstrate significant timing ability at the 5% level in at least one regression test.

Why did *RP*, and to a lesser extent *YIELD* and *EP*, succeed in enhancing portfolio returns? More important, are they likely to do so in the future? We believe that the literature review on the predictability of long-horizon stock returns provides the answer. If the market risk premium varies through time, long-horizon stock returns *should be predictable*. These variables should move with the unobservable market risk premium and continue to predict long-horizon stock returns.

Will *RP* continue to predict as well in the future? Possibly. In 1990, we noticed that *Value Line*'s prediction of median three to five year appreciation potential hit a low in August, 1987, shortly before the crash. This drew our attention, encouraged the development of the *RP* model, and later we saw how the model fit into the stock predictability literature. As we are all aware, a model usually performs better in the period in which its predictive content is "discovered" than in later periods. However, we believe, that *RP* will continue to predict returns better than dividend yield and earnings-price ratio because it is a direct measure (although possibly biased) of the unobservable market risk premium.

Finally, how could an individual implement an *RP*-based strategy? One approach would be to calculate *RP*, perhaps every three months, and to compare its current value to its historic distribution as presented in Table 1. If *RP* is well below average, perhaps below the first-quartile value of 10.1%, then the portfolio's equity weight can be reduced below the investor's long-run target equity weight. If *RP* is well above average, perhaps above the third-quartile value of 16.9%, then equity weight can be increased. This type of strategy would allow an individual to increase equity exposure when the rewards to bearing stock market risk appear above average and to lower exposure when the rewards appear below average. In so doing, we believe that an investor will likely increase the portfolio's long-run return without increasing the average risk exposure.

We caution, however, against an all-or-nothing timing strategy and other timing strategies that require *sharp* swings in the portfolio's equity position. To illustrate why, suppose an individual investor who maintains constant portfolio weights of 50% stock–50% debt. The stock predictability literature encourages varying the equity weight around 50%. But how far should the investor allow the weights to vary? The answer requires balancing the benefits of diversification across assets against the benefits of market timing. Nobel-laureate Paul Samuelson (1990) recommends a modest range for the equity weights of perhaps 40% to 60% around the 50% long-run target weight. In essence, he argues that the benefits of diversification across assets are more certain than the benefits of market timing. Other economists would encourage a wider range. In summary, the stock predictability literature suggests that the individual investor might benefit from varying the equity weight around the long-run target weight based on market conditions, but the investor should probably exercise moderation in establishing the acceptable range of equity weights.

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NOTES

1. They conclude that nominal, real, and excess stock returns are highly autocorrelated, but slowly mean reverting. Excess returns (returns less Treasury bill returns) prove most useful for market timing purposes. See Fama and French (1988a).
2. *Value Line* forecasts began at the end-of-quarter 1968.1. The 1968.1 value of *X* forecasts 1968.2 and later returns. *Value Line* did not publish median appreciation potential for a few weeks surrounding the 1972.3 quarter. Thus *RP* has one missing observation.
3. The last observation for the dependent variable covers 1977.1–1978.2. The last observation for *RP* reflects the end-of-December 1976 value.
4. The regression results for 1968.2–1987.1 yield a critical value of 0.1037 (0.1819/1.7545).
5. These forecast horizons are set to maximize 1968.2–1978.2 predictive content. See Reichenstein and Rich (1992).
6. The small stock portfolio data came from Ibbotson Associates (1992).
7. For a discussion of the quadratic regression methodology see Treynor and Mazuy (1966) and Admati, Bhattacharya, Pfleider, and Ross (1986). For a discussion of the dummy variable regression methodology see Henriksson and Merton (1981).

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